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ABSTRACT

The state of education today is a somewhat long story whose plot includes progress, accomplishment, mediocrity, and failure. Trends in achievement over the last two decades are mixed. Americans are gaining in equality of educational achievement. High school students read rather well (at least compared to the common understanding) and write quite poorly. Young adults in America are largely literate, but they fail alarmingly at many common tasks described to them through print. Finally, the proportion of the population reaching a higher-order, or critical, thinking level is likely seriously inadequate. (YLB)

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WHAT HIGH SCHOOL STUDENTS KNOW AND CAN DO

Paul E. Barton*

The typical report of a blue ribbon education commission, or popular book on the state of education today, sums up the state of American public education in a paragraph, or perhaps a page. That message is uniformly simple, and usually devastating: our students may do the basics ...but many can't... and they can't think. And things have been getting worse for a couple of decades. If the writing is of adults, an alarming portion of them are said to be illiterate, or nearly so. While an encouraging word may be thrown in here and there, it is a message of gloom, and we are falling behind in world economic competition. I have participated in sounding such alarms.

To say otherwise would be out of step with the times, and make one suspect ...an apologist for some special interest group. While I do not so much intend to say otherwise I do have to say that the story is not as simple as you might like it to be, nor as wholly devastating as you may fear it is. So I may try your patience with an effort to convey a somewhat longer story whose plot includes progress, accomplishment, mediocrity, and failure.

The principal points will be:

- that <u>trends</u> in achievement over the last two decades are mixed;

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- that we are gaining in equality of educational achievement;
- that our high school students read rather well (at least compared to the common understanding) and write quite poorly;
- that our young adults are largely literate but they fail alarmingly at many common tasks described to them through print; and
- that the proportions reaching a higher-order, or critical thinking level is likely seriously inadequate.

TRENDS

Most commission reports about education, and such popular books as E.D. Hirsch's Cultural Literacy, have emphasized the downside of educational achievement over the last one to two decades. We should be able to recognize the positive developments as well as the negative, without fear that to do so is to weaken the case for educational reform. To recognize the positive in fact strengthens that case because it provides the reassurance that with focused attention and clear purpose, results can be obtained.

Amidst the alarm that has been sounded about widespread illiteracy it may come as a surprise that our students were better readers in 1984 than in 1971, based on NAEP assessments of 9-, 13-, and 17-year-old students. This resulted largely from raising more students to minimal levels than lifting more to advanced levels; but progress there was, nevertheless.

In student writing the level of mediocrity was unchanged in the decade from 1974 to 1984. Writing proficiency had dipped from 1974 to 1979, and then recovered to 1974 levels. While we have not lost ground in writing, we are not far above ground either, and writing is not a success story for American education.

While NAEP assessed literacy among young adults in 1985, there have not been consistent measures over time and precise statements cannot be made. But we can be certain that we are, over long stretches of time, making progress and as we do we raise our standard

- from being able to sign ones name 100 years ago, to
- having a fourth grade reading ability in World War II, to
- reaching the eighth grade level during the War on Poverty of 25 years ago.

Appropriately, the question is whether the progress we are making is keeping pace with the demands society places on individuals, and here, to paraphrase Robert Browning, the measurer's reach exceeds his grasp. If put to a vote, however, the proposition that we are still behind would pass with a lopsided majority.

NAEP just measured students' knowledge of history and literature, well reported in the book What 17-Year-Olds Know, by Diane Ravitch and Chester Finn, and while the results are not encouraging, we do not have past assessment with which to compare. The informed speculation would be that they know less, given the declining attention to teaching content in social studies and to a likely declining consensus on what constitutes a core body of literature worth learning about.

A few months from now we will know what happened in the 1980's in the critical subjects of science and mathematics. In general, NAEP assessments found slippage in the 1970's among 17-year-old students. We do know we fare poorly among developed countries in international assessments.

A study conducted in Chicago, Sendai, Beijing, and Taipei, now in the process of being reported (by Harold W. Stevenson, et al), points out that our "math problem" begins early. Says Stevenson: "Among the students in the top five percent at grade one across all four cities, there were only three American Children." (If Chicago students had performed equally well there would have been 40). These results parallel a previous study when Americans were represented by the Minneapolis metropolitan area. Of as great a concern was the fact that both the American students and their parents thought they were doing well in mathematics, and the American students were "more optimistic about their future performance ...than.. Chinese and Japanese children."

PROGRESS TOWARD EQUALITY

We seem to be moving toward greater equality in educational achievement, and the continuation of that trend is heartening both from the standpoint of possibilities for greater parity in general in American society and for meeting employer skill needs. The critical area of reading shows this and I will use the four reading assessments from 1971 to 1984 to describe this greater equality.

While reading achievement among white students was practically flat across this period, there were substantial increases in performance among both Black and Hispanic 9-, 13-, and 17-year-old students.* While gaps narrowed, they are still huge; in 1984 Black and Hispanic 17-year-old students read only about as well as their White 13-year-old counterparts.

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*Of some concern, however, is the fact that there were no gains by Black 9-year-olds from 1980 to 1984.

While students from "advantaged urban" areas stayed level, students from rural and "disadvantaged urban" areas gained.

Students with parents who were not high school graduates gained, while those with more educated parents gained little or not at all.

The Southeast, historically the lowest region in student achievement, gained ground.

These gains in equality have come through raising the performance of lower achieving students; performance has been stagnate at more advanced levels. In that period of time, the nation went "back to the basics," and tested for "minimal competencies." And while this concentration produced results, it left a whole lot of room for improvement at the top.

CAN READ... CAN'T WRITE

We have highly developed the instructional modes of reading, we give it time in the schools, and our 17-year-old students can read. Writing instruction has been sporadic, agreement on instructional modes is rather new, and it does not get equal billing in the classroom. These same students write poorly.

By age 17, all students had achieved rudimentary reading skills, and 97 percent had reached a basic level where they have the ability to understand specific or sequentially related information. The great majority ...84 percent... could read at the intermediate level, which means that they can search for specific information, interrelate ideas, and make generalizations based on what they read; they did this dealing with reading passages from literature, science, and social studies.

At the adept level, there was a huge drop in performance; just 2 in 5 reached this level, where they must deal with relatively complicated information. For example, they are likely to fail at an assignment where they are asked to read a 12-paragraph account of the history of voting rights for women and answer questions based on it.

We lost 95 percent of 17-year-old students, at the advanced reading level where they are required to synthesize and learn from specialized materials, including scientific materials, literary essays, historical documents, and materials found in professional and technical working environments.

The levels of achievement in writing are disappointing, and on some tasks dismaying. The relatively happy state of affairs with respect to reading gives way to gloom when we examine writing.

Informative Writing. While around 6 in 10 eleventh graders assessed in 1984 could write adequate descriptions based on familiar, relatively simple information or experiences, only about 3 in 10 wrote an adequate description of a modern painting. On more difficult tasks requiring some analysis of social science passages, only 7 to 25 percent performed adequately, while 8 in 10 reached a minimal level of accomplishment.*

Persuasive Writing. In this kind of writing, students try to win others to their point of view, defending their positions or arguing for a specific course of action. On four different tasks, between 15 percent and 28 percent of the 17-year-olds performed adequately, while from 60 to 90 percent performed minimally.

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*The task on which 25 percent performed adequately required students to read a passage about frontier life. Then they were asked to write a comparison of modern-day food with frontier food.

Imaginative Writing includes the entire range of literacy and expressive writing. In three such writing tasks, from 18 to 48 percent of eleventh graders performed adequately or better, and from 66 to 88 percent performed minimally or better.

NAEP also analyzed student performance in the mechanics of writing, spelling, grammar, and punctuation. Achievement levels were relatively high, and control of written English increased at the older ages, reflecting the considerable attention these matters get in the schools.

CULTURAL AMNESIA?

In our legitimate concern about productivity and our competitive position abroad, the nation has looked intently at literacy, and at whether our math, science, and technological literacy is good enough. As federal resources have dwindled for NAEP, its assessments have generally narrowed. However, thanks to the initiative of the Educational Excellence Network, and funding from the National Endowment for the Humanities, NAEP was able to assess knowledge of literature and U.S. history, on the part of 17-year-old students. The findings were just reported in a book by Diane Ravitch and Chester Finn, in What do our 7-year-olds know?, and what they didn't know came to be well reported in the press last fall.

This assessment generated considerable concern about whether the nation is developing a case of cultural amnesia, although there is not complete agreement

on how badly the students did. I will attempt to convey the flavor of the findings in a couple of paragraphs.

More than 9 in 10 a) know that Thomas Edison invented the light bulb, b) could find the Soviet Union on a map of Europe, and c) knew that Alexander Graham Bell invented the telephone. Just three in ten could a) place the Civil War in the correct 50-year-band, b) knew what the Magna Carta is, and c) knew that the controversy surrounding Senator Joseph R. McCarthy focused on investigations of individuals suspected of Communist activities. About half knew that Joseph Stalin was the leader of the Soviet Union when the United States entered the second World War.

In literature, nine in ten knew about Noah, Moses, and Romeo and Juliet (and fewer than that for all other literature questions). Eight in ten knew that Huckleberry Finn is about an orphan boy and a runaway slave, that Plato and Aristotle are best known as philosophers, and that Merlin was the magician who advised King Arthur. Just two in five knew that The Grapes of Wrath is about a family that migrated from the Dust Bowl to California, and that Pride and Prejudice is about how the daughters of the Bennet family found husbands.

How important is it that we successfully transmit the culture to succeeding generations? Is our emphasis on education for running the economy endangering teaching and learning in the "soft" area of the humanities? These are important questions for the business community as it attempts to influence educators in the United States. NAEP's 1988 assessment, now in the field, is going deeper into history, and ...thanks to funding by the National Geographic Society... will test knowledge of geography as well.

READING PRINT ...AND THEN USING IT

In the fall of 1986, NAEP released the results of the literacy assessment of young adults aged 21-15, based on a household assessment conducted in 1985. The report was entitled Literacy: Profiles of America's Young Adults. The assessment consisted of 90-minute household interviews with a nationally representative sample of some 4,000 young adults, irrespective of how much education they had; it included college graduates as well as high school dropouts. I am here reporting on high school level achievement, so I will address the literacy skills of two groups: those who dropped out during their high school years and those who graduated (this later category includes those who had some post-secondary education, so the results will overstate what high school graduates can do).*

But first, I should describe this literacy study, for it differs in important respects from past studies, and from frequently used concepts of literacy and illiteracy.

First, our study recognizes that there is no single cut-point that separates those who are fully literate from those who are totally illiterate; instead, there is a continuum of literacy skills in our nation and this had led us to "profile" literacy skills rather than project a single number of "illiterates," as previous studies have tried to do.

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*I have not included young adults with college degrees (2 year or 4 year). They, of course, perform considerably better.

Second, we have chosen to profile literacy in three areas, rather than as a single construct:

-- Prose Literacy: reading and interpreting prose, as in newspaper articles, magazines, and books;

-- Document Literacy: identifying and using information located in documents such as forms, tables, charts, and indexes; and,

-- Quantitative Literacy: applying numerical operations to information contained in printed material such as a menu, a checkbook, or an advertisement.

Third, we went beyond the traditional approach of just asking questions and reporting the average percent of correct answers. Using psychometric technology, proficiency scales were created that range from 0 to 500, for each of the three aspects of literacy. At points along the scale, proficiency levels are illustrated with tasks at which people who score at that level are likely to succeed. Such a scale enables comparisons among many groups within the population, allows us to relate proficiency to other information collected about the young adults (30 minutes of the assessment were devoted to background questions), and secures the opportunity for accurate comparisons over time if the survey is repeated.

Practically all young adults who finished high school (and had some post-secondary education) are able to use printed information to accomplish tasks that are routine or uncomplicated. Below, results for the 200 scale level are presented.

-- For Prose Literacy, 97 percent performed at least at the 200 level on a scale of 0 to 500. One task

characteristic of performance at this level is writing a simple description of the type of job one would like to have (199). Another is accurately locating a single piece of information from a newspaper article of moderate length (210).

-- For Document Literacy, 97 percent performed at least at the 200 level. One characteristic task directs the reader to match money-saving coupons to a shopping list of several items (211). Another task involves entering personal background information on a job application (196).

-- For Quantitative Literacy, 93 percent performed at least at the 225 level. The task that best typifies this level requires totaling two entries on a bank deposit slip (233).

While we can take some solace in the finding that almost all perform at these basic levels, literacy skills seem to us to be distressingly limited: relatively small proportions of young adult high school graduates were proficient at levels characterized by the more moderate or relatively complex tasks.

-- For Prose Literacy, just 27 percent performed at the 325 level. A representative task at this level required locating information on the basis of three bits of information that are repeated throughout a lengthy news article.

-- For Document Literacy, only 11 percent are estimated to be at or above the 350 level, where they are likely to be able to do tasks such as figuring out, from a bus schedule--the time on a Saturday morning when the second bus arrives at the Downtown Terminal (334).

-- For Quantitative Literacy, just 30 percent are estimated to be at or above the 325 level, where a typical task requires the reader to examine a menu to compute the cost of a specified meal and to determine the correct change from a specified amount (337). (Only about 13 percent were at the 350, level where performance included figuring the exact amount of a 10 percent tip).

Needless to say, high school dropouts performed much less well than graduates. On the prose scale, just 10 percent were able to find information in the news article, compared with 27 percent for graduates. On the quantitative scale, the results were similar. Just 10 percent were able to compute the cost of a meal from a menu, compared with 30 percent for graduates.

The above is gleaned from examining just two levels on each of the three scales. Everyone can look at representative tasks at different proficiency levels and make their judgments about what proportions are ill-prepared for life's challenges. The levels of literacy needed by any individual depend on the demands individuals face in different life areas ... of work, home, and community. And within those areas the questions become: What job? Doing what in the home? Doing what in the community? The NAEP study has measured what

young adults can do; it has not measured what different settings require of them. For example, fewer than one in twenty is at the proficiency level (375) represented by the task of estimating cost using grocery store unit price labels. Is that acceptable? Is that a failure during the school years?

These levels would seem to us to be disappointing and inadequate if we require a more competent labor force in an economy increasingly shaped by technology.

Not only are small proportions of young adults making it to advanced levels on the literacy scales, but proficiency levels vary considerably among different populations of young adults. (The differences described below are based on the entire sample of 21- to 25-year-olds, instead of only high school graduates.)

- Black young adults, on average, perform significantly below White young adults, with Hispanic young adults performing mid-way between.
  - -- Eighty-six percent of Black, 94 percent of Hispanic, and 98 percent of White young adults perform at least at the 200 level on the Prose Literacy Scale.
  - -- Eleven percent of Black, 24 percent of Hispanic, and 43 percent of White young adults perform at or above the 325 level on this scale.
- The longer the time spent in school, the higher the literacy proficiency. Again, using the prose scale:
  - -- At or above the 200 level are 71 percent of those with 8 or less years of school, 88 percent of high school dropouts, and 97 percent of the young adults who have a high school diploma or some post-secondary education.

-- At or above the 325 level are 0 percent of those with 8 or less years of school, 10 percent of high school dropouts, 27 percent with a high school diploma or some post-secondary education, and 63 percent with a post-secondary degree.

While the use of simple print for routine tasks is within the grasp of most young adults, literacy skills remain an unreached potential for a large proportion. This is an important finding for programmatic efforts aimed at improvement. The deficiency identified here is in young adults' skills at dealing with the more complex tasks embedded in print materials. Evidently, the printed word usually can be decoded, but the information obtained is not processed correctly to solve the problem. This information is as important for school curricula as it is for shaping adult literacy programs.

LOW PROFICIENCY IN HIGHER ORDER SKILLS

The drumbeat of NAEP reports, reflected in the above, is that we are raising the bottom of achievement, that we are getting more students to the middling reaches on the proficiency scales but that we are deficient--and not advancing--on the "higher-order skills" front. We summed this situation up last March in a brief publication called Learning to be Literate in America.* David Kearns, Chief Executive Officer of Xerox Corporation, expressed the business concern concisely in the foreword to that report:

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*by Arthur N. Applebee, Hudith A. Langer, and Ina V. S. Mullis

> "American business needs workers who not only are proficient in the basic skills, but who know how to think and can communicate what they're thinking. We need workers who can adjust to change, who can absorb new ideas and share them easily with others. In short, we need people who have learned how to learn."

And we need sufficient students who can enlarge the pipeline into those critical professions of the teaching and application of mathematics, science, and engineering. The concern of business has been vocally expressed in many forums during the 1980's. Representaive of this expression of concern would be a 1983 survey of Fortune-listed companies in which 9 out of 10 employers said that greater emphasis on math and science in Japan is an important factor in Japan's successful competition with the U.S. At the same time, 9 out of 10 agreed with the proposition that "It is more important for students to learn how to think, that is, how to solve problems..., than it is for them to learn facts and figures."*

On "the state of literacy in America," the NAEP report summed it up this way:

> "• Most children and young adults demonstrate a surface understanding of a range of materials appropriate for their age."
>
> "• Only small percentages of children and young adults can reason effectively about what they are reading or writing."

And that summary will suffice as well for this presentation.

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*Quoted in More Math and Science = More Options, Paul E. Barton, National Institute for Work and Learning, 1984. This publication also examines ways corporations can participate in programs at the community level to enlarge "critical skills."

BEING LITERATE ABOUT LITERACY

I have, perhaps, said too much, and in to much detail. I have done so because I have seen too many reports on American education to be content to cite a single study, or the change in SAT or ACT scores, or make generalizations that are factually untrue. Typically, they are superficial statements about the proficiency of American students, complaining that these students have only superficial knowledge. I urge that, if we are to chart the right course, we become literate about literacy.

Thank you for your patience.

Paul E. Barton

The Conference Board

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